Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal Form

Section 1. General administrative information

Monitor Listed Stock Adult Chinook Salmon Escapement

Bonneville project number, if an ongoing project 9703000

Business name of agency, institution or organization requesting funding
Nez Perce Tribe

Business acronym (if appropriate) NPT

Proposal contact person or principal investigator:

Name	Dave Faurot
Mailing Address	P O Box 1942
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Fax	(208)634-4097
Email address	

Subcontractors. List one subcontractor per row; to add more rows, press Alt-Insert from within this table

Organization	Mailing Address	City, ST Zip	Contact Name
River Masters Eng.	P O Box 306	Pullman, WA 99163	Tom Bumstead

NPPC Program Measure Number(s) which this project addresses.
7.1.D2, 7.1.C3, 7.3.B2

NMFS Biological Opinion Number(s) which this project addresses.

ESA Section 10 permit; NEPA Analysis

Other planning document references.

If the project type is "Watershed" (see Section 2), reference any demonstrable support from affected agencies, tribes, local watershed groups, and public and/or private landowners, and cite available documentation.

Snake River Recovery Plan: IV.A.3 Initiate actions to improve survival rates of juvenile and adult salmon throughout the migration corridors of the tributaries and mainstem Snake and Columbia Rivers. The operational objective shall be to achieve spawner to spawner survival ratios for the ESA listed-stocks over two generations (8-10 years) that are in excess of those needed for replacement. Develop research and monitoring protocols and processes to enable this procedure.

Wy Kan Ush Me Wa Kush Wit (Spirit of the Salmon): Vol. I, 5B-39. Establish and monitor escapement checkpoints at mainstem dams and in index subbasins... Methods to be used include video counting at hydro power dams and at key locations in tributaries,.... The least intrusive methods should be used to collect the necessary information. Establish additional monitoring programs for each of the subbasin tributary systems to monitor adult escapement and resulting smolt production, and to evaluate (by measuring the number of adults returning) the ability of managers to meet goals set by the Columbia River Management Plan (CRFMP).

Subbasin.

Salmon River

Short description.

Monitor abundance-based adult salmon spawner information over time, with a passive temporary facility using underwater time-lapse video technology. This project would allow comparison to redd count survey data and evaluation of methods on unsupplemented chinook salmon populations.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction		Watershed
	Resident fish		O & M		Biodiversity/genetics
	Wildlife		Production	X	Population dynamics
	Oceans/estuaries	X	Research		Ecosystems
	Climate	+	Monitoring/eval.		Flow/survival
	Other	+	Resource mgmt		Fish disease
			Planning/admin.		Supplementation
			Enforcement		Wildlife habitat en-
			Acquisitions		hancement/restoration

Other keywords.

Control, unsupplemented, video, escapement, migratory timing

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
8909802	Idaho Salmon Supplementation	Use the Secesh River and Lake Creek as control streams for supplementation evaluations, and compare to adult escapement via redd counts.

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Coordinate the listed stock chinook salmon escapement monitoring project with state and federal management agencies in the Snake River basin.		Tasks not measurable
2	Coordinate the escapement monitoring evaluation study with the National Marine Fisheries Service (NMFS).	a	Provide annual reports to NMFS which summarize project activities relating to chinook salmon populations listed under the ESA.
3	Determine the abundance and timing of migration of adult chinook salmon into the Secesh River and Lake Creek drainage.	a	Install the temporary fish counting structures and underwater video in early-June to early-July as water discharge and water velocity criteria allow.
		b	Operate and maintain the fish counting station on a daily basis to ensure safe and accurate operation of the facility.
		c	Implement the monitoring and evaluation plan for the fish counting station to ensure that adult salmon do not reject the structure and that fish passage is not impeded.
			Determine timing of adult spawner

		d	migration into the Secesh River and Lake Creek systems.
		e	Accurately determine the adult salmon escapement into the Secesh River and Lake Creek drainages. Determine if and estimate the number of hatchery strays into the system.
		f	Compare the fish counting station escapement number with intensive and index area redd count technique estimated numbers and compare the relative accuracy of each method over time.
		g	Compare the adult spawner migration into the Secesh River and Lake Creek with stream discharge and water temperature and examine correlations between these variables over time.
		h	Investigate the use of underwater video in taking morphometric measurements of adult salmon migrating into the Secesh River and Lake Creek.
		i	Remove the fish counting stations by mid September or after the adult spawner migration is finished.
4	Transfer of Technology.	a	Prepare and provide annual reports summarizing all activities associated with the adult chinook salmon escapement monitoring project.

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	03/1997	10/2004	5
2	03/1997	12/2004	5
3	06/1997	04/2005	60
4	09/1997	04/2005	30

Schedule constraints.

Extreme high or low spring runoff could affect the dates of installation of the fish counting stations. Delay in the signing of a Memorandum of Agreement with the USFS could affect the installation dates and sites of the fish counting stations.

Completion date.

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel		80,000
Fringe benefits		18,000
Supplies, materials, non-expendable property		6,000
Operations & maintenance		8,000
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		5,000
PIT tags	# of tags:	0
Travel		8,000
Indirect costs		34,000
Subcontracts		1,000
Other		
TOTAL		160,000

Outyear costs

Outyear costs	FY2000	FY01	FY02	FY03
Total budget	160,000	162,000	162,000	164,000
O&M as % of total	95	95	100	100

Section 6. Abstract

This project is designed to accurately determine the abundance and migratory timing of adult chinook salmon into the Secesh River and Lake Creek using underwater time-lapse video photography. The information gathered with this technology would be compared to redd count survey data to determine the relative accuracy and cost of each method. Underwater time-lapse video photography is a passive methodology that does not trap, hold or handle this ESA listed species. These streams have never been supplemented and the fish are considered to be wild and naturally spawning populations. The NPPC Columbia Basin Fish and Wildlife Program directs programs and management to maintain the genetic life history and morphological characteristics, and to conduct projects to determine population status, life history and other data on wild and naturally spawning populations. The Secesh River is a control population under the Idaho Salmon Supplementation study. Adult escapement information would aid this project in calculation of adult escapement to smolt production and smolt to adult escapement

information. Escapement activities are coordinated with state and federal management agencies and ESA species monitoring is coordinated with NMFS. Escapement monitoring using underwater time-lapse video photography is a relatively new application of this technology. This methodology has the potential to provide more consistent and accurate information with less monetary and personnel expenditure. Accurate adult escapement information would allow managers to determine if recovery actions were recovering these unsupplemented populations.

Section 7. Project description

a. Technical and/or scientific background.

Traditional chinook salmon redd count surveys in Idaho have relied upon one-time counts as an index of relative abundance over time (trend) . These counts have assumed that spawning has been completed, that viewing conditions for aerial surveys were acceptable, and that spawner distribution has remained constant. These surveys did not account for adult salmon straying, pre-spawning mortalities, and differences in redd counting techniques or personnel. The factor used to convert redd numbers into abundance estimates has not been determined for individual streams and is another potential source of error. The information gained from one-time counts may not be accurate for determination of adult spawner abundance. Recent surveys, on some streams, have used multiple ground counts of spawning activities for more accurate escapement abundance estimates. Time, money and personnel involved with multiple counts have increased as managers strive for more accurate estimates. Chinook salmon in the Secesh River and Lake Creek are wild, unsupplemented populations, and are a listed species under the Endangered Species Act. The U.S./Canada Fishery Agreement and Idaho Salmon Supplementation studies use the Secesh River as a control stream. Accurate escapement monitoring of this population is very important to fish mangers in their evaluation of anadromous salmonid recovery in the Snake River basin.

Several Northwest Power Planning Council (NPPC) program measures in the Columbia River basin Fish and Wildlife Program (FWP) direct the implementation of the listed stock chinook salmon escapement monitoring project.
FWP program measure 7.1.D2 directs the program should consider for inclusion the following.....management to maintain the genetic life history and morphological characteristics of wild and naturally spawning populations including sustainable long-term spawning escapement and redd counts.
Measure 7.1C3 directs projects to determine population status, life history and other data on wild and naturally spawning populations.
Measure 7.3.B2 also directs “Implement high priority supplementation projects but those should include.... monitoring and evaluation .” The current escapement monitoring project addresses a chinook population that is a control population under the Idaho Salmon Supplementation study.

This investigation began in 1991 with planning and a conceptual engineering design of an adult fish counting facility for the Secesh River funded by the Pacific Salmon Treaty. Preliminary design work followed in 1994. Approximately $125,000 has been invested in the planning process since 1991. The Pacific Salmon Treaty funding was used as seed money to begin the project. Treaty funding was not sufficient to allow full project implementation on the Secesh River and Lake creek. The Nez Perce Tribe has worked cooperatively with the Idaho Department of Fish and game (IDFG) and the U. S. Forest Service (USFS) with the planning and developmental stages of this project.

The project began in 1997 on the Secesh River on private property in 1997. Delays in project and budget approval hampered timely hiring of project personnel and delayed purchase of backup field equipment. Equipment failures (with no backup) prevented continuous data collection in 1997. In 1998, the Secesh River and Lake Creek facilities are expected to be fully operational and to be located on USFS lands.

Fish Management Consultants. 1991. Feasibility design and location of a weir for escapement estimation of summer chinook salmon in the Secesh River, Idaho. Report prepared for the Nez Perce Tribe. Fish Management Consultants. Olympia, Washington.

River Masters Engineering. 1994. Preliminary design of a non-impeding fish counting facility in the Secesh River for adult summer chinook. Report prepared for the Nez Perce Tribe. River Masters Engineering. Pullman, Washington.

b. Proposal objectives.

Objective 1 - Coordinate the listed stock chinook salmon escapement monitoring project with state and federal management agencies in the Snake River basin.
This objective is not measurable.

Objective 2 - Coordinate the escapement monitoring evaluation study with the National Marine Fisheries Service (NMFS).
The Nez Perce Tribe does not recognize that the Endangered Species Act takes precedence over or precludes Tribal sovereignty or rights in any manner. However, the Tribe does recognize that salmon are a listed species, and strongly believes in coordination efforts to monitor, conserve, protect and recover populations at low levels of abundance and high risk of extirpation. In that regard the Columbia River Inter-tribal Fish Commission maintains a Section 10 permit by and through the Bureau of Indian affairs, coordinating Tribal activities relative to listed salmon populations. An annual report is submitted to NMFS which summarizes project activities relating to chinook salmon populations listed under the Endangered Species Act.

Objective 3 - Determine the abundance and timing of migration of adult chinook salmon into the Secesh River and Lake Creek drainages.
A temporary fish counting station was operated in the Secesh River in 1997. Plans for 1998 are to relocate the Secesh River facility to a better location and to install a second temporary fish counting station in Lake Creek. These two temporary facilities would continue to be operated in 1999 and beyond. The purpose of these facilities is to accurately determine adult escapement into wild chinook salmon production areas. Adult escapement information as determined by this project would be compared to annual redd counting surveys to assess if redd count information provides reliable indices of adult salmon escapement.

H01a: Adult chinook salmon escapement into the Secesh River and Lake Creek is accurately estimated using various redd count survey methods.
Corollary: Rejecting H01a indicates that redd count surveys do not accurately estimate or reflect the actual number of adult chinook salmon returning to the Secesh River and Lake Creek.

Managers need accurate abundance information on listed chinook salmon to determine if recovery actions are increasing/recovering wild and natural Snake River salmon populations in an unsupplemented (control) stream system. These are passive facilities that do not require the trapping, holding or handling of any fish. A monitoring and evaluation plan has been developed to provide safeguards against any potential migration impedance caused by the facilities.

Objective 4 - Transfer of Technology.
An annual report summarizing all activities associated with the adult chinook salmon escapement monitoring project will be prepared.

c. Rationale and significance to Regional Programs.

The escapement monitoring project is designed to evaluate the use of a temporary, passive time-lapse underwater video recording system in determining adult chinook salmon escapement into the Secesh River and Lake creek. Fish managers need accurate information upon which they can base decisions. Adult fish abundance information is the basis for adult to adult survival (i.e. is there an improving trend in a stream, is a recovery action improving survival, is there a difference in survival between hatchery and supplemented fish, etc.). Adult fish abundance information is also critical for relating adult escapement to smolt production estimates.

In the long-term, this project is designed to help answer these types of questions by determining if underwater time-lapse video is a better method to determine abundance in a stream rather than one-time redd counts of index areas. The accuracy and reliability of one-time redd count surveys have been questioned. More intensive multi-pass surveys have been tried. These also have bias related to survey conditions and the surveyors themselves. Surveyors have been harassed by private landowners in Secesh Meadows

who claim surveyors are disturbing fish and walking on redds. Video tapes leave a permanent record that is not subject to bias of methodology or personnel.

Treatments or experiments need a control to which results can be related. The Secesh River is a control stream for the Idaho Salmon Supplementation studies. The Secesh River and Lake Creek have not been supplemented and have one of the few remaining wild and naturally spawning populations of chinook salmon in the Snake River basin.

Several Northwest Power Planning Council (NPPC) program measures in the Columbia River basin Fish and Wildlife Program (FWP) direct the implementation of the listed stock chinook salmon escapement monitoring project.

FWP measure 7.1.D2 directs the program should consider for inclusion the following...."management to maintain the genetic life history and morphological characteristics of wild and naturally spawning populations including sustainable long-term spawning escapement and redd counts." Again, the Secesh River and Lake Creek have not been supplemented and have one of the few remaining wild and naturally spawning populations of chinook salmon in the Snake River basin. Long-term redd count surveys are available for index sites on the Secesh River. Comprehensive redd counts have ben conducted since 1996.

FWP measure 7.1C3 directs projects to determine population status, life history and other data on wild and naturally spawning populations.

FWP measure7.3.B2 directs "Implement high priority supplementation projects but those should include....monitoring and evaluation" (comparison to control systems).

Other programs also prescribe activities to further conservation and recovery of these populations. Specifically:

Snake River Recovery Plan: 4.1.b ....develop and implement management plans for Snake River spring/summer chinook salmon conservation hatchery programs which should include:...., Monitoring and Evaluation Strategy,..

Wy Kan Ush Me Wa Kush Wit: Vol. I, 5B-39. "Establish and monitor escapement checkpoints at mainstem dams and in index subbasins... Methods to be used include video counting at hydro power dams and at key locations in tributaries,.... The least intrusive method should be used to collect the necessary information. Establish additional monitoring programs for each of the subbasin tributary systems to monitor adult escapement and resulting smolt production, and to evaluate (by measuring the number of adults returning) the ability of managers to meet goals set by the Columbia River Management Plan (CRFMP)."

Project history

This investigation began in 1991 with planning and a conceptual engineering design of an adult fish counting facility for the Secesh River funded by the Pacific Salmon Treaty. Preliminary design work followed in 1994. Approximately $125,000 has been invested

in the planning process since 1991. The Pacific Salmon Treaty funding was used as seed money to begin the project. Treaty funding was not sufficient to allow full project implementation on the Secesh River and Lake creek. The Nez Perce Tribe has worked cooperatively with the Idaho Department of Fish and game (IDFG) and the U. S. Forest Service (USFS) with the planning and developmental stages of this project.

The Listed Stock Chinook Salmon Escapement Monitoring project (97-030-00) began in 1997 with a budget of $139,700. The project was located on the Secesh River on private property in 1997. Delays in project and budget approval hampered timely hiring of project personnel and delayed purchase of backup field equipment. Equipment failures (with no backup) prevented continuous data collection in 1997. Coordination with USFS on a Memorandum of Agreement for preferred 1998 fish counting station site locations is continuing. In 1998 and beyond, the Secesh River and Lake Creek facilities are expected to be fully operational and to be located on USFS lands.

e. Methods.

Task 3a and 3i pertain to the installation and removal of the fish counting stations. Each fish counting station consists of an upstream and a downstream, tripod supported, fish guiding fence that leads into the fish counting chamber. The design of the tripod supports, longitudinal stringers and spaced pickets is similar to the standard Alaskan picket weir. The fish counting station is basically an opening that the fish are directed through. The opening to the fish counting station is 3 feet wide and 2 ½ feet high and 4 feet long. The fish counting station is placed across the stream with the guiding fences angled 30 - 45 degrees to the banks. The counting chamber is placed in the thalweg. The video camera is attached to the side of the counting chamber, 2 ½ feet away from a clear plexiglass window. As a fish travels through the 4 foot long counting chamber, the video camera takes 2 pictures every second. The chamber is illuminated with red light at night to facilitate nighttime picture resolution. The far side of the counting chamber is aluminum painted white to create a contrasting background for the photos. The camera is an ultra-high resolution monochrome (black and white) CCD camera sealed in a waterproof housing. A cable carrying the video signal, power, and camera control conductors is connected to the video recorder. Recording is continuous while the station is in operation. A photocell automatically turns the lights on during times of darkness. All electrical equipment uses 12 volt DC which is furnished by a combination of generator, batteries, and a hydro generator powered by stream current.

Task 3b (daily operation and maintenance of the fish counting station) requires tapes to be changed daily, the power source to be checked for proper operation and charge level, and the pickets on the fish guiding fence to be cleaned of debris.

Task 3c is the monitoring and evaluation portion of the project to determine if the structure is impeding migration of fish. The monitoring and evaluation plan has been

developed to provide safeguards against any potential migration impedance. The plan contains criteria for determining when facility impacts are significant to salmon, guidelines for corrective actions, and a plan implementation schedule. Snorkel and discrete bank observations will be used to determine if the fish counting station is impeding fish movement. A narrative of the results and the locations of fish sighted are reported on a form that includes a map of the project area. Observations will be made daily upstream and downstream of the counting facility, with particular attention paid to downstream salmon holding areas. If any problems are identified according to plan criteria, the pickets or entire counting station will be removed as outlined in the M&E plan.

Task 3d and 3e (determination of abundance and migration timing) will be accomplished by analyzing the video tapes. Tapes will be "collapsed" onto a separate tape that shows only frames with fish pictured . This tape will be analyzed for fish movement by date, by time of day, and by direction of movement. Results will show timing of upstream migration over the season (abundance) and on a diel basis, upstream movement by time of day, and net activity (upstream and downstream) by time of day. Fish with an adipose fin or other fin missing will be recorded, as will sex if it can be determined.

Task 3f will compare the fish counting station escapement number with index area and intensive redd count estimate numbers annually to compare the relative accuracy of each method.

> H01a: Adult chinook salmon escapement into the Secesh River and Lake Creek is accurately estimated using various redd count survey methods.
> Corollary: Rejecting H01a indicates that redd count surveys do not accurately estimate or reflect the actual number of adult chinook salmon returning to the Secesh River and Lake Creek.

Task 3g will compare the adult spawner migration into the Secesh River and Lake Creek with stream discharge and water temperature, and examine correlations between these variables over time.

Task 3h will investigate the use of underwater video in taking morphometric measurements of adult salmon migrating into the Secesh River and Lake Creek. It has not been determined if this task can be accomplished or by what method. One simple method that has been used before is to place centimeter markings on the back and front walls of the counting chamber. The distance the fish is located from the front plexiglass or the aluminum back wall affects the apparent fish length. A fish passing through the chamber very close to the clear plexiglass wall, could be measured accurately by the centimeter markings on the plexiglass, but the fishes length would be distorted on the markings on the back aluminum wall. Fish lengths of fish passing somewhere in the middle of the chamber would have to be estimated. These estimations may or may not be accurate enough to develop length groups and age classes. Other methods will be investigated. The University of Idaho optics department may be able to develop an experimental method. Vaki Aquaculture Systems Ltd. in Iceland has developed a fish

counter that might be adaptable to this purpose. Infra-red light beams are sent from a scanner unit to a receiver on the other side of an opening. When the fish swims through the net of light beams, the resulting silhouette image is used to count and estimate the size of the fish.

f. Facilities and equipment.

The Listed Stock Adult Chinook Salmon Escapement project is conducted out of the Nez Perce Tribe's field office in McCall, Idaho. This office currently houses NPT personnel from three other BPA funded projects. The office facilities are adequate for all administrative and personnel needs. The project leader has a Pentium computer and the project utilizes two GSA fleet vehicles. Secure storage of large equipment (ie. fish counting station materials) still needs to be addressed.

The fish counting station includes tripod supported upstream and downstream guide fences with a video equipped counting chamber. Tripods are constructed of 2 inch galvanized steel pipe connected with Kee Klamp structural pipe fittings. Additional weight will be placed on the horizontal braces of each tripod to help anchor tripods in place. Support brackets are attached to the upstream tripod leg to support the longitudinal picket stringers. Picket stringers are constructed of 1/4 inch angle aluminum with one inch diameter holes punched on two inch centers. After the tripods, support brackets, and stringers are set in their final positions, one inch galvanized pickets are installed in the stringers. The guide fences will be installed at a 30 - 45 degree angle to the bank. As upstream migrating salmon encounter the downstream guide fence, they will continue to be oriented upstream and move into the counting chamber area. Likewise, as downstream migrating salmon encounter the upstream guide fence they will be guided into the counting chamber area. The counting chamber will be installed in the channel thalweg, which is anticipated to be the preferred adult salmon migration corridor. Upstream or downstream migrating adults can move freely into and through the 4 foot long, 3 foot wide, by 2 ½ foot high counting chamber. An underwater video camera, attached to the side of the chamber takes pictures of the fish while they are in the counting chamber, at the rate of two frames per second (Hatch et al. 1994). The pictures are recorded on an 8 mm time-lapse video recorder. The fish are not trapped, held or handled in any manner. Tapes have a 36 hour duration, but are changed once a day. A photo cell turns lights on during periods of darkness. Artificial light in the form of two arrays of 36 red LED's mounted by the camera and directed across the counting chamber is the preferred source of light for night photography. If the red lights do not provide enough light for satisfactory photo resolution, a white light will be substituted. There is concern the white light might slow fish entrance into the counting chamber. The white light also requires much more power than the red lights.

All electrically powered equipment uses 12 volt DC. A hydro generator (a propeller spun by the water current generates an electrical current) placed between the upstream and downstream guide fences, is used to charge two 6 volt DC 225 ampere hour golf cart

batteries. The 6 volt batteries are connected in series to provide 12 volt DC current to the camera and recorder system. The controller system has the capability to add a second hydro generator, solar panels, or a 12 volt DC generator if more power is required. This is a new use of hydro generators. The system will be tested in a McCall Hatchery raceway during the winter of 1998.

g. References.

Columbia River Basin Fish and Wildlife Program. 1994. Northwest Power Planning Council. Portland, OR.

Fish Management Consultants. 1991. Feasibility design and location of a weir for escapement estimation of summer chinook salmon in the Secesh River, Idaho. Report prepared for the Nez Perce Tribe. Fish Management Consultants. Olympia, Washington.

Hatch, D.R., M. Schwartzberg, and P.R. Mundy. 1994. Estimation of Pacific salmon escapement with a time-lapse video recording technique. North American Journal of Fisheries Management 14:626-635.

River Masters Engineering. 1994. Preliminary design of a non-impeding fish counting facility in the Secesh River for adult summer chinook. Report prepared for the Nez Perce Tribe. River Masters Engineering. Pullman, Washington.

Snake River Recovery Plan. 1994. National Marine Fisheries Service. Seattle, WA.

Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of the Salmon). 1995. Columbia River Inter-tribal Fish Commission. Portland, OR.

Section 8. Relationships to other projects

Idaho Salmon Supplementation studies operates juvenile screw traps in both the Secesh River and Lake Creek close to the video fish counting stations. Two of their goals are to relate escapement to smolt production, and smolt to adult return. To do this they need to have adult escapement numbers that are as accurate as possible. Other information that would be of value to them is sex ratio, and age classes. They must use information from spawning ground surveys, carcass collection, and off site weirs (South Fork Salmon River weir). Each of these methods has limitations. Video photography has the potential to provide this information.

Section 9. Key personnel

Research Director: Paul Kucrea, Director of Biological Services, 160 hrs
Nez Perce Tribe Department of Fisheries Resources Management

EDUCATION: Bachelor of Science. 1975.
Utah State University.
Major: Fisheries Management.

Completed MS studies at the University of Idaho 1990
Major: Fisheries Management.

PROFESSIONAL EXPERIENCE:

1991-present Director of Biological Services with the Nez Perce Tribe Department of Fisheries Resources Management. Responsible for technical program direction and administration of the Fisheries Research Division.

1988-1991 Senior Fisheries Biologist with the Nez Perce Tribe Fisheries Department.

1987-1988 Acting Fisheries Program Manager with the Nez Perce Tribe Fisheries Department. Responsible for fisheries program management and direction.

1984-1986 Senior Fisheries Biologist with the Nez Perce Tribe Fisheries Department. Conducted research on juvenile steelhead trout life history characteristics and abundance in relation to physical habitat parameters on five streams.

1982-1983 Project fisheries biologist with the Nez Perce Tribe Fisheries Department. Responsible for conduct of a physical and biological inventory of streams on the reservation proper with emphasis on anadromous salmonids.

1978-1980 Fisheries biologist with the Colville Confederated Tribes Fish and Wildlife Department. Developed fishery management programs for the Colville Tribe on their 1.3 million acre reservation and the 1.7 million acre ceded area.

1975-1978 Fisheries research biologist with W.F. Sigler and Associates, Environmental Consulting Firm. Ecological and fish life history research on 110,000 acre Pyramid Lake, Nevada.

Unique Abilities:

Certified Fisheries Scientist - AFS

Experienced with Endangered Species Act and management of listed fish species.

Experience in program development and procuring project funding.

Research and management experience with resident and anadromous species.

Familiar with Tribal government and management approaches.

Trained in CPR and First Aid.

Certified SCUBA diver - NAUI

Publications

Kucera, P.A. and J.L. Kennedy. 1977. Evaluation of a sphere volume method for estimating fish fecundity. The Progressive Fish Culturist. 39(3)115-117.

Kucera, P.A. 1978. Reproductive biology of the tui chub, Gila bicolor, in Pyramid Lake, Nevada. Great Basin Naturalist. 38(2): 203-207.

Kennedy, J.L. and P.A. Kucera. 1978. The reproductive ecology of the Tahoe sucker, Catostomus tahoensis, in Pyramid Lake, Nevada. Great Basin Naturalist 38(2): 181-186.

Vigg, S., P. A. Kucera. 1981. Contributions to the life history of Sacramento perch,
Archoplites interruptus, in Pyramid Lake, Nevada.Great Basin Naturalist 41(3): 278-289.

Sigler, W.F., W.T. Helm, P. A. Kucera, S. Vigg and G. W. Workman. 1983. Life history of the Lahontan cutthroat trout, Salmo clarki henshawi, in Pyramid Lake, Nevada. Great Basin Naturalist 43(1): 1-29.

Kucera, P.A., D.L. Koch and G.F. Marco. 1985. Introductions of Lahontan cutthroat trout into Omak Lake, Washington. North Amer. Jrnl. Of Fish. Mngt. 5(2): 296-301.

Johnson, J.H. and P.A. Kucera. 1985. Summer-autumn habitat utilization of subyearling steelhead trout in tributaries of the Clearwater River, Idaho. Can. Jrnl. Zool. Vol, 63:2283-2290.

Kucera, P.A. 1989. Nez Perce Tribal review of the Imnaha River Lower Snake River Compensation Plan. AFF1/LSR-89-08, Tech. Rep. 89-7. Annual project report to the U.S. Fish and Wildlife Service. Nez Perce Tribe Fisheries Dept., Lapwai, ID. 49 pp.

Kucera, P.A. and M.L. Blenden. 1996. Summary report of 1996 project activities relating to endangered chinook salmon populations listed under the Endangered Species Act. Nez Perce Tribe Department of Fisheries Resources Management, Lapwai, Idaho. 60 pp.

Technical Advisor: Jay A. Hesse, Research Coordinator, no ISS funding associated
Nez Perce Tribe Department of Fisheries Resources Management

Education: M.S. in Fisheries, Michigan State University, 1994
B.S. in Fisheries and Wildlife, Michigan State University, 1992

Duties: Technical direction and supervision of fisheries research projects, research coordination, Nez Perce Tribe LSRCP project implementation, report writing, monitoring and evaluation plan and proposal development, tribal fisheries research representation at federal and state meetings, budget preparation, personnel supervision.

Experience: Project Leader, Idaho Salmon Supplementation Study. Nez Perce Tribe. July 1994 - October 1997.

Publications: Hesse, J. 1997. A-run steelhead status in tributaries of the lower Clearwater River, Idaho. In Interactions of hatchery and wild steelhead in the Clearwater River of Idaho. 1995 Progress Report, Fisheries Stewardship Project, USFWS Report. November 1997.

Hesse, J.A., P.J. Cleary, and B.D. Arnsberg. 1995. Salmon Supplementation Studies in Idaho Rivers. Annual Report - 1994. U.S. Department of Energy - Bonneville Power Administration. Portland, Oregon.

Hesse, J.A. and B.D. Arnsberg 1994. Salmon Supplementation Studies in Idaho Rivers. Annual Report - 1993. U.S. Department of Energy - Bonneville Power Administration. Portland, Oregon.

Hesse, J.A. 1994. Contribution of hatchery and natural chinook salmon to the eastern Lake Michigan fishery, 1992-1993. Masters Thesis, Michigan State University.

Dave Faurot, Project Leader, 1 FTE
Nez Perce Tribe, Department of Fisheries Resources Management

Education:

B.S. Degree in Engineering	U.S. Coast Guard Academy, New London, CN	1965
M.S. Degree in Aquatic Ecology	University of Michigan, Ann Arbor, MI	1980

Pertinent Employment:

National Marine Fisheries Service Pasco, WA 1976-1982
Primary assignment was research and study of the effects of dams on migration rates, timing, and survival of juvenile salmon and steelhead in the Columbia River system.

Alaska Department of Fish and Game Soldotna, AK 1983-1984
Conducted creel census and tag and release study on adult chinook salmon.

U S Fish and Wildlife Service Kenai, AK 1985-1990
Performed scientific research and administrative duties in planning, implementing and evaluating fishery resource management in naturally functioning wilderness areas.

Publications:

Faurot, D.A. 1980. Juvenile salmonid outmigration of the Mid-Columbia River, 1977. M.S. Thesis, University of Michigan.

Sims, C.W., J.G. Williams, D.A. Faurot, R.C. Johnsen, and D.A. Brege. 1981. Migrational characteristics of juvenile salmon and steelhead in the Columbia River basin, 1980 Vol II. Final Report to the U.S. Army Corps of Engineers. Seattle, WA.

Faurot, D.A., L.C. Stuehrenberg, and C.W. Sims. 1982. Radio tracking of juvenile salmonids in John Day Reservoir, 1981. Final Report to the U.S. Army Corps of Engineers, Seattle, WA.

Faurot, Dave, and Ray N. Jones. 1990. Run timing and spawning distribution of coho and late run chinook salmon in the Kasilof River watershed, Alaska, 1987. U.S. Fish and Wildlife Service, Alaska Fisheries Technical Report Number 9. Anchorage, Alaska.

Faurot, Dave. 1992. Fishery resources in the Kisaralik River basin, Yukon Delta National Wildlife Refuge, Alaska. U.S. Fish and Wildlife Service, Alaska Fisheries Technical Report Series. Anchorage, AK.

Other personnel:

A ½ FTE permanent Lead Fisheries Technician will be hired in April 1998. Qualifications require at least a B.S. Degree in a fisheries related field.

Seasonal Department Biological aides will be the remainder of the work force.

Section 10. Information/technology transfer

An annual report following scientific publication guidelines is distributed through the BPA publications system. A presentation to the Idaho Chapter of the American Fisheries Society is planned for the 1999 or 2000 annual meeting.